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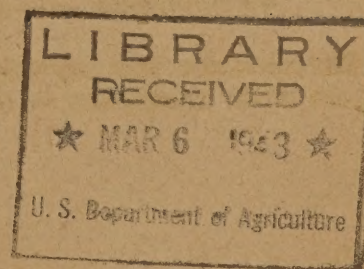
AGRICULTURAL ENGINEERING EXTENSION WORK
IN 1943

Four regional conferences of extension agricultural engineers were held to formulate coordinate plans for dealing effectively with farm machinery and the related problems concerning critical materials, farm structures, household equipment, fire prevention, fire-fighting equipment, and safety. The conference of the Eastern States was held in New York, N. Y., September 30, 1942; of the Southern States, in Memphis, Tenn., October 26-28; of the Central States, in Chicago, Ill., October 29-31; and of the Western States in Sacramento, Calif., November 3-5.

Representatives of various public and private agencies cooperated with the extension agricultural engineers in reporting their prospective programs, discussing the problems, and developing further proposals for extension work. At each regional conference, recommendations were made on general agricultural engineering wartime work and on farm-machinery extension work for 1943. Regional plans have been combined in this composite report to summarize points applicable to the four regions.

The problems outlined here relate to the work of several other extension specialists, in addition to that of engineers. In such instances, all subject-matter specialists concerned with a particular problem should develop a coordinated phase of work providing for the cooperation of each specialist. 4-H Club members can aid materially in solving many of these problems, particularly the ones relating to fire prevention, safety, and the maintenance of buildings and equipment.

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WARTIME WORK IN EXTENSION AGRICULTURAL ENGINEERING IN 1943

Farm Machinery* -Reconditioning, Conservation, and Use

Increased quantities of food, fat, and fiber are to be produced in 1943 with a shrinking supply of new machinery and a diminishing force of experienced farm labor.

Limitation Order L-170 of the War Production Board stipulates that the amount of new farm machinery available in 1943 will be only 20 percent of the average amount purchased in 1940 and 1941. This deficiency must be made up by use of repaired and reconditioned old machinery which normally would be junked. New repair parts will be available for the reconditioning of machinery, but these parts are becoming more difficult to obtain.

Farm labor is becoming increasingly scarce and less capable as the armed forces, war industries, and other activities "siphon" from the farms large proportions of the trained operators of farm mechanical equipment. And, by the same means, the number of skilled mechanics is being reduced drastically in the machine shops and garages of rural areas.

The farm-machinery problem resolves itself into the following opposing forces:

1. The production quotas of many farm products have been increased.
2. The supply of new machinery in 1943 will be approximately one-fifth of the amount farmers need.
3. Farm operators and farm labor have decreased in numbers, and the decrease may total over a million workers in 1942 and 1943.
4. Mechanics and skilled repairmen have decreased in numbers in local repair shops and garages.
5. Worn and obsolete machinery must be reconditioned to meet the deficiency of new machinery, and this must be accomplished with decreasing numbers of skilled repairmen.
6. The machines must be operated with smaller numbers of operators, and with less-experienced operators.

The magnitude and complexities of the problem demand a highly coordinated work program with all Federal, State, local, and commercial agencies uniting in this service. Organization, direction, and support of the program are needed in the States, the counties, and the communities. Specific objectives should include-

1. Rationing of the limited supply of new machinery to have it reach the farms and farming areas where it will be most useful.
2. Reconditioning of all reclaimable machinery needed for the production, harvesting, and processing of farm products.
3. Training of mechanics and repairmen in adequate numbers to repair and recondition all farm machinery in need of this work.
4. Training of new operators to use the machinery skillfully, to extend the useful life and service of the machinery, and to obtain the maximum benefits in the production, harvesting, and processing of farm products.

*The term "farm machinery" or "machinery" is used broadly to include field machinery power units, hand tools, and all other machinery essential in the maintenance and operation of a farm.

5. The promotion of care and maintenance programs to conserve all kinds of machinery through correct lubrication, proper adjustment, adequate housing, and the protection of critical parts.
6. Development of various practices of sharing machinery to extend its usefulness and to keep it operating to complete the production, harvesting, and processing of all essential crops.
7. Completing the 1943 season with machinery in the best possible condition for use in 1944.

Farm Structures and Equipment

Limitations on structural materials and a shortage of workmen place farm structures largely on a maintenance basis for the duration. The maintenance of farm buildings should not be neglected, for this would cause excessive depreciation and the loss of valuable materials, crops, livestock, supplies, and equipment. Moreover, the neglect of buildings and equipment, particularly those relating to water and sanitation, will endanger the life, health, and morale of farm people.

Although farm-building work will be limited largely to the maintenance of present structures, it should be on a planned basis. A comprehensive program is needed, now, to develop ways and means of maintaining farm buildings and equipment with the minimum use of skilled labor and critical materials. Temporary methods of maintenance may be necessary, but they are better than no maintenance. The maintenance program should be accomplished without causing the general expansion farm structures.

An educational program on farm-building maintenance and remodeling should be a coordinated program of interested public and private agencies. Each public agency, company, and supply merchant should have a part in the program, and its particular services should be used effectively. Thus, the obtaining of cooperative assistance and the organization of a program would be the first major problem. Other essential steps follow:

1. Safe standards of permanent construction should be maintained: They should not be weakened to meet the needs of the emergency.
2. Some building plans should be so designed as to reduce to a minimum the need for scarce and critical materials.
3. The new and emergency designs should provide for the maximum utilization of farm labor and farm materials, including used materials salvaged from the razing of buildings that have lost their usefulness.

The following phases of the farm building program should be emphasized:

1. Maintenance of sound foundations and roofs for all necessary buildings.
2. Tearing down of useless and unsafe structures, and the salvaging of materials for the repair of essential structures.
3. Use of native or salvage materials wherever this is possible in the maintenance of structures.
4. Use of cheap or inferior substitute materials only as a temporary expedient rather than as a permanent practice.
5. Remodeling or rearrangement of buildings, farmsteads, gates, and fences to utilize economically space, labor, and materials, and to provide safe, sanitary, and durable structures that may be used efficiently, particularly in the saving of labor.
6. The maintenance of water supplies, water systems, heating equipment, sewage-disposal systems, and related structures or equipment in a sound and sanitary condition.

7. Development of construction plans for building labor saving equipment. Teaching farmers how to use such equipment.
8. Protection of buildings against fire and other hazards which might cause the loss of life, property, and supplies.

Processing and Storage Equipment

Serious problems in transportation make it necessary for agricultural engineers to give increasing attention to the processing and storage of farm products and the attendant problems of containers and packages.

The practice of dehydrating fruits and vegetables is growing rapidly on commercial farms and in the farm home. This is a direct wartime necessity. Increased numbers of dehydrators of farm size and home size are required, and must be designed and built with the minimum amount of critical materials.

Expansion of livestock and poultry enterprises increases the demand for feed-processing equipment, storage facilities, and suitable equipment for the processing and storing of meat, dairy, and poultry products.

Reserve supplies of grain for food and feed make grain storage an acute problem. Likewise, the increased production of peanuts, soybeans, and other oil-producing crops increases need for storage.

Agricultural engineers should develop and adapt building and equipment plans to meet the needs for processing and storing farm products. In many instances, existing structures can be remodeled to fit the new service requirements.

Home-made Equipment

Restrictions on the manufacture of farm equipment and changes in crop-production methods increase the need for many types of home-made equipment. Development of labor-saving equipment which can be built at home from noncritical materials will be a major contribution to food production and the war effort.

Many kinds of proved home-made equipment are in operation on farms. Plans should be prepared to show how this is built, so other farmers can build and use similar equipment. The attention of farmers should be called to the various designs of labor-saving equipment available in blueprints from State Extension Services.

New methods of handling farm products and supplies brought about by the war may require some types of equipment that cannot be purchased. Agricultural engineers should anticipate these needs, design the equipment, and prepare plans showing how it can be made from noncritical materials. Frequently, worn or obsolete machines may be remodeled for useful service.

Blueprints and other plans of home-made equipment should include accurate construction details, bills of materials, and operating instructions.

Household Equipment

The maintenance of household equipment in good serviceable condition is essential to the war effort. The preservation and preparation of food are necessary in the maintenance of the farm family's health, safety, and efficiency. Use of labor-saving equipment in the home affords time for the growing of field and garden crops, livestock, and poultry. The shortage of farm labor places extra emphasis on the release of time from household duties for productive enterprises.

Household equipment is scarce and difficult to obtain. The present equipment must be repaired or reconditioned and used carefully to make it outlast the war.

Repair parts are still available for many types of household equipment, but some kinds are scarce. Procurement of necessary repair parts promptly is therefore essential.

Minor repairs may be made in the home. But dangerous or complicated equipment, such as electrical, should be repaired by competent service mechanics. Care and repair work should emphasize proper maintenance with attention to necessary cleaning, correct use, checking at intervals, and providing repairs when they are necessary.

Agricultural engineers and home-management specialist share the responsibility of initiating programs designed to keep the household equipment in proper repair. Farm people should be trained to make minor repairs. It may sometimes be necessary to train servicemen or servicewomen to do the repair work ordinarily provided by dealers and the utilities.

Fire Prevention and Fire-Fighting Equipment

Farm and rural fires kill an average of 3,500 people annually and destroy property worth \$200,000,000. With the Nation at war, the danger is intensified. This calls for effective fire prevention and fire-fighting effort in every rural community. The fire-control work organized in 1942 should be expanded and intensified in 1943. The program should include-

1. A complete fire-control organization in every community.
2. A clean-up campaign to remove fire hazards.
3. More equipment for farm fire companies wherever additional equipment is needed.
4. Repair and maintenance of all local fire-fighting equipment including spray rigs, ladders, hand tools, and fire extinguishers.
5. Review of results of the past season and the development of definite plans for each community in 1943.
6. The cooperative effort of every agency and person concerned.

The extension agricultural engineer has a definite responsibility in fire prevention and control in assisting with cooperative programs and in his activities with farm buildings, machinery, and home equipment. Related activities include fire inspection of buildings and premises; elimination of fire hazards in the design and construction of farm buildings; development of safety practices in handling and storing explosives and inflammable material; development of fire-fighting equipment; and the adaptation of sprayers and other machines for fire-fighting service.

Safety on the Farm and in the Home

Agriculture is a hazardous industry. According to the National Safety Council, more deaths occur from accidents in agriculture than in the trades and services. Accidents are responsible for 4,000 deaths a year on farms. Danger from accidents increases in wartime.

Unless every reasonable precaution is used to remove the hazards, more accidents will be caused by inexperienced farm labor in handling dangerous livestock and in operating power machinery. Other hazards will occur if buildings and equipment are allowed to deteriorate. Less obvious but equally important hazards occur through the employment of boys and girls, women and elderly men, to do the heavy work normally done by seasoned farm hands.

A large proportion of farm and home accidents could be avoided by following engineering practices. Such practices include the sound construction of buildings; orderly arrangement of equipment; use of safety devices; systematic arrangement of farm shops, and shelters for livestock and equipment; use of safety shields on power equipment, and employment of systematized methods of operating the farm and home.

Agricultural engineers should develop illustrated material which describes safety methods and equipment. This material should be used in addition to the safety features included with different phases of extension subject matter.

Extension work in safety should be coordinated and promoted in cooperation with other interested groups including educational, civic, religious, and commercial agencies which will be participating in accident-prevention work under the guidance of the National Safety Council. The following suggestions are recommended:

1. All subject-matter specialists should include in their programs of work and in their publications, safety as it relates to their various fields of work.
2. As a war measure, safety should be emphasized to conserve manpower, and the time of doctors, nurses, and members of the family required to care for the injured.
3. Safety measures should include the prevention of accidents that would damage or destroy machinery and equipment.
4. New farm workers should be trained in safety practices as a regular part of their farm training and experience.
5. The safety programs for rural youth conducted for 4-H Club and older-youth groups should be given special wartime emphasis in a farm accident-prevention program.

GENERAL RECOMMENDATIONS FOR FARM-MACHINERY EXTENSION WORK IN 1943

General Situation

The production of food, fat, and fiber is essential for the armed forces, war production and civilian needs, and for support of our Allies. The production of these essentials is threatened by increasing scarcity of farm labor and new machinery. Farms generally are well equipped with power and machinery for normal crop production, but a critical situation exists in the maintenance of adequate farm machinery for the production of the kinds and quantities of farm products needed in wartime.

Several factors contribute to this critical situation. New machinery available for farmers in 1943 will be only 20 percent of the average annual amount purchased in 1941 and 1942. This means that about 80 percent of the old equipment, which ordinarily would be discarded, must be rebuilt and reconditioned, and this reconditioning is in addition to the repairs normally required. Repair parts are becoming scarce and difficult to get, although about 130 percent of the average amount used in 1940 and 1941 will be available in 1943. The increasing scarcity of farm labor makes the use of dependable labor-saving equipment essential for attainment of production goals. Production of special crops such as hemp, guayule, and fiber flax, and the increased demand for beef, pork, poultry, eggs, dairy products, fruits, vegetables, and oil-producing crops require the use of dependable machinery.

A program to obtain maximum use and service from existing farm machinery should include: 1) Reconditioning of all reclaimable machinery, 2) Care and repair of all machinery, 3) Sharing equipment, 4) Use of home-made equipment, 5) Development of labor-saving practices, 6) Training of new workers to operate machines skillfully, 7) Salvage and repair of usable parts and usable machines that otherwise would be junked.

These factors are basic. They reach into every region and State - to every farm. Moreover, they are interrelated not only with each other but with innumerable other problems concerning plants, animals, and people in fighting a war. Also, they are complicated by differences in soils, climates, and crops. Here, differences in regions, States, and localities are so large and so numerous that no single plan could present all details concerning the need for wells and pumps for the irrigated farm; sprayers and special equipment for the fruit farm; milking machines and feed grinders for the dairy farm, and similarly, the need for producing grain food and fiber throughout the land.

But, the basic problems remain, and they must be solved before America is in a position to put forth her all-out war effort, and the solution will require the participation of every individual and of every agency which can cooperate effectively. The groups of people in position to aid in the solution of the farm-machinery problem include farmers, farm laborers, local leaders, vocational teachers, county agents, extension specialists, supervisors of farm programs, mechanics, implement dealers, garagemen, and representatives of manufacturers and farm journals, trade associations, the press and radio. These persons and their respective agencies are considered in the development of the suggested plan.

Suggested Farm Machinery Plan

Time.

State extension agricultural engineers should give from 40 to 60 percent of their time to the planning and conducting of farm-machinery work.

Reconditioning.

Situation. - The situation in 1943 appears as follows:

1. Reduction of new machinery in 1943 to 23 percent of the amount purchased in 1940 requires the reconditioning of all usable machinery.
2. All machinery should be checked thoroughly at the end of the season or at the earliest possible date. Farmers sometimes delay the checking of machinery for repairs.
3. Old machines that would be discarded normally, should be dismantled and thoroughly checked for worn or damaged parts, and should be repaired or replaced with new parts.
4. Many worn and broken parts, normally discarded, can be repaired or reconditioned and used again. The practice of salvaging and reconditioning parts should be encouraged.
5. Farmers usually delay buying or ordering of repairs until machines are needed. Now, it will be necessary to order parts 3 to 4 months before they are actually necessary, to assure their delivery on time.
6. Many farmers buy more parts than are necessary for immediate needs and reasonable reserves. Hoarding should be discouraged.
7. Skilled mechanics and repairmen are scarce in many rural areas. Therefore, farmers should make early arrangements for repair work requiring skilled mechanics and special shop equipment.
8. Few farmers paint their machinery or otherwise provide protective covering. But protection should be provided for the surface of machinery; for the internal parts against erosion and freezing. Likewise, rubber tires, drapers, and other special parts should be protected.

Extension activities. - The following extension activities concern the reconditioning of machinery:

1. Farmers and others concerned should be informed on the need for reconditioning and on the necessity for ordering repair parts and services promptly.
2. Essential information should be developed and released on reconditioning of machinery, the checking of machines, the reconditioning of parts, the ordering of parts and repair and protection of machines.
3. Demonstrations or schools should be used to show systematic procedure in disassembling, and in the preparation of lists of used parts.
4. The conservation, repair, and utilization parts and used machines should be encouraged.
5. Farmers should be aided in arranging to have their complicated repairs made by skilled mechanics at properly equipped repair shops.
6. Guides should be developed for farmers in making the less-complicated repairs on the farm.
7. Information on painting and other methods of protection should be supplied to farmers.

The seven points listed in extension activities will vary from State to State. Likewise, the methods of conducting the work will vary with local needs, personnel, and facilities. In general, use of the radio, press, letters, and posters will serve the over-all promotional work. In some instances, surveys may be needed to determine the nature of machinery problems and the availability of parts, repairmen, and repair facilities. General meetings may be needed to bring together for cooperative work, farmers, neighborhood leaders, county agents, vocational teachers, and other representatives of public and private agencies. Demonstrations may be used to aid farmers and local repairmen. Local meetings and training schools will be helpful for service men, agricultural agents, and farm leaders.

Extension material.- Types of material essential for extension activities are:

1. Press and radio releases for general promotional work.
2. Check sheets for determining the parts needed on various types of machines.
3. Descriptive lists of machines and parts that fail most frequently, and suggestions for preventing excessive delays from such causes.
4. Circulars and posters to emphasize the need for ordering parts early.
5. Leaflets and circulars showing the general shop tools and equipment for general maintenance and repair of farm machinery.
6. Bulletins, circulars, charts and slidefilms showing the most important features in reconditioning and repairing.
7. Instructions for selecting, mixing, and applying paint properly to wooden and metal parts.
8. Instructions on the prevention of damage caused by rust, corrosion, freezing, and rodents.

The eight general types of extension materials are needed in addition to manufacturers' catalogs, instruction manuals, and lists of parts.

Care and maintenance.

Situation.- Care and maintenance are necessary for all farm machines - old, new, or reconditioned. These involve lubrication, adjustment, and protection. The situation on care and maintenance is indicated by the following:

1. The care and maintenance of farm machinery is not adequate on most farms.

2. Farm machinery is damaged by the use of wrong lubricants as well as by lack of lubrication.
3. Farm machinery often is improperly adjusted. This causes a reduction in the life and service of a machine; unreliable and inefficient service; an increase in the amount and cost of power and labor, lower yields of crops, and unnecessary danger to the operator.
4. Farm machinery is damaged severely by lack of shelter, or by inadequate shelter, and failure to provide other protection such as paint, grease, and weatherproofed covers.
5. Motors, pumps, and internal parts of other valuable machines are frequently destroyed or severely damaged by rust, corrosion, and freezing.
6. Lack of care in maintenance frequently results in the severe damage or destruction of pneumatic tires, binder canvas, hay ropes, and other parts.

Extension activities.- The following extension activities are directed to

the correction of wasteful conditions previously stated.

1. Encourage each farmer to develop and follow a program on the care and maintenance of machinery.
2. Issue seasonal instructions on lubrication, and hold meetings or demonstrations to promote adequate lubrication through use of the proper lubricants.
3. Use meetings or demonstrations and teaching material to instruct farmers on the essential adjustment of machinery to protect the machine and the crop.
4. Promote the proper protection of machinery by sheltering.
5. Issue guides, and otherwise promote the protection of machine parts most frequently damaged by the elements, rust, corrosion, dirt, freezing, livestock, and rodents.

Extension material.- Extension material is needed for use in a program on care and maintenance:

1. Press and radio releases emphasizing the program.
2. Inclusion in each bulletin, or circular relating to farm machinery of instructions in correct adjustment and proper lubrication.
3. Special leaflets or posters on machinery lubrication, adjustment, and protection.
4. Slidefilms and moving pictures.
5. Circulars, leaflets, and bulletins emphasizing the protection of machinery in storage; the remodeling, repair, and maintenance of machinery shelters, and the arranging, heating, and equipping of farm shops.
6. Manuals with instructions on the operation, adjustment, and lubrication of various types of machines.

Most of the subjects listed under the preceding six points are covered in the instruction manual accompanying most new equipment, but the manuals frequently become lost, damaged, or are not studied sufficiently so that the operators do not give the machines essential care. The importance of the manual should be emphasized in all extension work relating to adjustment and lubrication. Oil companies have issued complete instructions on correct lubrication of automobiles, trucks, tractors, and combines. The use of these is to be encouraged.

Training new operators.

Situation.- Shortage of farm labor necessitates the use of increasing numbers of inexperienced people - men, women, boys, and girls from farms, villages, and cities. These workers are lacking in the skills, experience, and understanding of farm machinery operation. Definite phases of the situation follow:

1. New operators must be taught how machines are operated to protect and improve the crop being planted, cultivated, or harvested; how to protect the soil and land improvements; and how to prepare good seedbeds.
2. New operators must be trained to operate machines skillfully in order to protect the machines from abuse and neglect which otherwise might damage the machines and cause valuable crops to be lost.
3. All machinery, particularly power machinery, is dangerous when operated by careless or inexperienced workers. New operators should be instructed in how to operate machinery safely for protection of themselves and others.

Extension activities. - Meetings, demonstrations, and schools are suggested as extension activities for training new operators. This phase of the program could be carried out as cooperative work by other specialists and cooperating agencies:

1. Agronomists and other crop specialists could aid in teaching the requirements of machine operation for different crops.
2. Field representatives and demonstrators of machinery companies could provide instructors for instructing new operators in the proper care and safe operation of machines.
3. Vocational agricultural teachers could organize or aid in the development of schools for training new operators.

Extension material. - Useful extension material for training new operators is indicated in the following:

1. Manuals for operating each type and kind of machine.
2. Circulars, bulletins, leaflets, and charts showing proper adjustments and methods of operating machines to protect the crop, the machine, and the operator.
3. Slidefilms, moving pictures, charts, and posters to show the correct methods of operation, particularly in teaching practices concerning new machines, new crops, and new agricultural practices.
4. News releases and radio programs to inform the public on the need for training new operators in the safety of machinery operation.

Sharing equipment.

Situation. - The present situation on the sharing of farm machinery differs from that of the past in intensity rather than in nature. Farmers in most communities, at some time or other, share equipment or services with their neighbors. Now, with less new equipment available and increased quotas of many crops, renewed emphasis is placed on sharing of equipment. Five methods of sharing equipment are recognized:

1. Exchange, 2. custom, 3. rent, 4. cooperative ownership, and 5. sale of surplus. Definite conditions are indicated:
1. Rationing of machinery is based upon increased effective use of existing machinery.
2. The practice of sharing machinery has declined in recent years, but now there is a growing need for its renewal.
3. Exchanging of equipment and services may extend effective use of many types of machines.
4. Custom operation of equipment is a general practice in many regions and can be extended to other regions and to other farm operations. Information is needed on fair custom rates where practices are new to the community.
5. Renting equipment is not a general practice, but as machines become scarce and difficult to replace, the practice of renting will be used instead of lending. The rental of equipment reveals a need for fair rates and some provision for fixing responsibility of owner and renter.
6. Cooperative ownership offers a possibility of extending use of machinery. This practice is being employed by many clients of the Farm Security Administration. Before promoting cooperative ownership, however, careful studies should be made of successful methods of managing equipment; State laws governing cooperatives, successful methods of organizing and financing cooperatives, and liability of members.

7. Many farms and communities have surplus equipment that could be listed and sold for use where needed.

Extension activities.- The promotion of wider use of farm machinery should include:

1. Publicity to encourage the sharing of machinery to achieve agricultural production goals.
2. Publicity to encourage exchange of equipment and services among neighbors.
3. Promotion of custom work in new areas and in new ways, and development of fair rates of payment.
4. Promotion of equipment renting and development of fair rental rates, together with agreements for the protection of owner and renter against loss from damage to machinery.
5. Promotion of cooperative ownership wherever the practice can be used to advantage. Information should be obtained on the organization and operation of cooperatives before the practice is promoted.
6. Organization should be developed to determine where machines are surplus and where scarce. Information obtained should be circulated and posted to aid in bringing together prospective buyers and sellers.

Extension material.- Extension materials for sharing equipment:

1. Radio statements, news stories, and other information material on exchange of equipment, custom operations, renting, cooperative use, and sale of surplus machinery.
2. Rate schedules for custom work, including rates per acre, hour, and unit (bushel or ton).
3. Rate schedule for the renting of machinery including rates per acre, hour, and unit (bushel or ton).
4. Information on organization and management of farm-machinery cooperatives. This material may be obtained from the Farm Security Administration and other sources.
5. Handbook of data on operating costs of various machines, the duty and capacity of different machines, and their average and potential life and service.
6. Lists of available surplus machinery for sale by farmers or dealers, and lists of prospective buyers for machines of various type.

Home-made equipment.

Situation.- The situation in regard to home-made equipment has changed during the war. As new equipment becomes increasingly scarce, more dependence must be placed upon the building and using of home-made equipment. Ingenious devices must be developed and used to save crops, supplies, material, and labor. Types of home-made equipment needed are for:

1. Haying - buck rakes, stackers, and racks.
2. Bulk handling of grain.
3. Transportation and storage of fuel and oil.
4. Hay-drying.
5. Shop.
6. Livestock and poultry.
7. Vegetable handling and storage.

8. Irrigation structures.
9. Straightening of baling wire.

Extension activities.- Extension activities necessary for use of home-made equipment:

1. Preparation and distribution of essential plans or models of types of equipment that have been used successfully.
2. Location of various new types of home-made equipment, preparation of plans and their distribution to farmers.
3. Development of new and improved types of equipment, and preparation of plans.
4. Cooperative work with extension agricultural engineers in other States in the exchange of ideas and plans relating to home-made equipment.
5. Demonstration of methods of building and using home-made equipment.

Extension materials necessary:

1. Construction plans.
2. Bills of materials.
3. Building instructions.
4. Operating instructions.

Additional material might include: photographs, slidefilm moving pictures, radio releases, news releases and circulars. These plans and other related materials should be exchanged between States to provide the widest use of plans and ideas, and avoid unnecessary duplication of effort by extension agricultural engineers.

Engineering practices.

Situation.- Vast saving of time, labor power, materials, supplies, and farm products can be effected by the adoption of good engineering and management practices. Examples:

1. Hitching of two or more implements together and operating them with the same power and labor ordinarily used for one implement.
2. Use of larger teams wherever they can replace two or more one- and two-horse outfits.
3. Arrangement of buildings and farmstead to accomplish chores with least time and energy.
4. Elimination of unnecessary operations.
5. Use of safety equipment and practices.

Extension activities.- Better engineering and management practices should include identification and description of time- and labor-saving practices, so that improved methods may be used by others. Farm-management specialists and others should be consulted to obtain the best practice.

Extension material.- Extension material should be prepared and distributed in the form of bulletins or circulars to acquaint the public with new and improved engineering and management practices.

Cooperation.

The suggested extension activities are listed with the idea that the whole farm-machinery program will be organized and conducted cooperatively, each public and private agency concerned contributing to the program in the manner in which it can serve most effectively. In each State and in each county a list should be prepared to include each cooperating agency and the service it can render.

The extension materials listed are those needed in addition to manufacturer's service manuals, parts lists, assembly diagrams, and operating instructions furnished with each machine. Extension material developed in one State should be made available for use in other States that have need for the same material. Bulletins, circulars, and other helpful information should be obtained from public and private agencies cooperating in this program.

The farm machinery problems extend to every crop and livestock enterprise and to the related activities of processing, storing, marketing, and management. Therefore, the problems concern not only agricultural engineering, but also the fields of many subject-matter specialists. Similarly, they affect administrators and supervisors of extension programs. Thus, the problem exacts the support of extension specialists and supervisors. And, the state-wide program should be developed mutually by specialists and supervisors.

SUGGESTIONS FOR ORGANIZING THE EXTENSION PROGRAM IN

FARM MACHINERY -- CARE, REPAIR, AND SHARE

The national program to make our present supply of farm machinery last throughout the war, will not be exclusively an Extension program. Opportunity is afforded to enlist the cooperation of several agencies of the Department of Agriculture, the Office of Education of the Federal Security Agency, and commercial people in the farm-machinery industry. The program is sufficiently important to merit active cooperation of all groups who can assist. It is necessary that our farm machinery be put into best condition to attain production goals in 1943. The machinery must be maintained for even more intensive use in 1944.

Leadership of the program as it concerns the Department of Agriculture will rest with the war boards, State and county. As a member of the war boards, the Extension Service will have an important assignment in helping to organize the program and in training those assisting to enable them to carry it out.

A. The Extension Service should -

1. Set up an extension committee to outline the proposed program on caring, for, repairing, and sharing farm machinery.
2. Assist State and county war boards in the organization of programs and in getting the work started.
3. Consult with and obtain the cooperation of all public and private agencies and organizations that can assist in organizing the program and in putting it into effect with farm people.
4. Assist in holding a State conference of representatives of public agencies and commercial concerns to plan a State program and agree upon the part each will take in carrying it out.
5. Develop plans for guiding county agents in the organization of county programs.
6. Prepare for local cooperators and neighborhood leaders such special materials as -
 - a. Outlines for conducting local farm-machinery repair programs.
 - b. Check sheets for determining needed repairs for various types of machines.
 - c. Manuals of instruction on care, repair lubrication, and operation of farm machinery.
 - d. Suggestions and aids for sharing equipment.
 - e. Plans for home-made equipment.
 - f. Information on labor-saving equipment and practices.

7. Prepare materials for supporting the program; such as -

- a. Information handbooks.
- b. Newspaper articles.
- c. Circular letters for use of county extension agents.
- d. Printed leaflets and posters.
- e. Radio scripts.
- f. Moving pictures and slidefilms.
- g. Window displays.
- h. Insignia for cooperators who have repaired their machinery.

8. Prepare plans for -

- a. Cooperation of 4-H Clubs in making surveys and checking repair needs.
- b. Encouraging boys, young men, and young women to attend vocational-training courses.
- c. Urging farmers to make all possible repairs at home.
- d. Encouraging farmers to use services of farm-machinery repairmen and automobile mechanics on reconditioning and more difficult repair jobs requiring special skills and equipment.

9. Provide facilities for exchanging plans for home-made equipment, information on labor-saving practices, and other cooperative aids.

B. County extension agents will -

- 1. Make care, repair, and sharing of farm machinery a basic part of Extension's work on the 1943 agricultural production program.
- 2. Assist the county war boards to hold a county conference of representative farmers, farm-machinery dealers, vocational teachers, and other interested persons, to plan the county farm-machinery program.
- 3. Determine local repair facilities - shops, supplies, and repairmen, and prepare lists for use by various cooperators.
- 4. Instruct community and neighborhood leaders for their duties as leaders.
- 5. Train 4-H Club leaders and members for such assistance as they may render.

6. Prepare and make use of materials as outlined in A-6, A-7 and A-8 (p. -).

7. Set up facilities for exchanging plans for home-made equipment, information on labor-saving practices, and other cooperative aids.

C. Community leaders in some States are the contact persons between neighborhood leaders and county extension office.

Where employed will -

1. Assist neighborhood leaders, where necessary, in carrying out various parts of the program or arrange with them to have persons designated to assisting with the program.

2. Arrange with county extension agents for training schools for themselves and neighborhood leaders.

3. Assemble, and report to the county extension office, information on progress of the program, difficulties encountered, and results.

D. The neighborhood leader is the key person in reaching every family in his neighborhood. Where used, he will -

1. Study instructions on duties of the neighborhood leader in the farm-machinery repair program.

2. Make contact with every farm family in his neighborhood, using literature, check sheets, or other materials as local plans may suggest.

3. Urge farmers to do as suggested in "E" below.

4. Be a good demonstrator by following promptly the recommendations in "E."

5. Report to the community leader results of program and difficulties encountered.

E. The individual farmer's responsibility will include -

1. Reconditioning of all reclaimable farm machinery and parts during the winter months.

2. Repairing all machinery and putting it into good operating condition by adjusting, oiling and protecting it from weather and other hazards.

3. Using home-made equipment where feasible.

4. Using labor-saving methods on his farm.

5. Salvaging usable repair parts and machines that otherwise would be junked.

6. Sharing equipment with neighbors, by -

- (a) Lending
- (b) Renting
- (c) Custom work
- (d) Cooperative ownership
- (e) Sale of unnecessary equipment

